

What is claimed is:

1. An etching gas composition for etching silicon oxide comprising a mixture of carbon fluoride gas in which the ratio of fluorine atoms relative to carbon atoms is less than 2 and an auxiliary gas including hydrogen, fluorine and carbon atoms.

2. An etching gas composition as claimed in claim 1 wherein the carbon fluoride compound includes a double carbon-carbon bond or a triple carbon-carbon bond.

3. An etching gas composition as claimed in claim 1 wherein said carbon fluoride gas is at least one member selected from the group consisting of  $C_5F_8$ ,  $C_4F_6$ ,  $C_3F_4$  and  $C_2F_2$ , and mixtures thereof.

4. An etching gas composition as claimed in claim 1 wherein said auxiliary gas is at least one member selected from the group consisting of  $CH_2F_2$  and  $CHF_3$ , and mixtures thereof.

5. An etching gas composition as claimed in claim 1 wherein the volumetric ratio of said auxiliary gas with respect to said carbon fluoride gas is in a range of about 0.1-3.0.

6. An etching gas composition as claimed in claim 1 wherein said etching gas composition further comprises CO.

7. An etching gas composition as claimed in claim 6 wherein the volumetric ratio of said CO with respect to said carbon fluoride gas is in a range of about 1-30.

8. An etching gas composition as claimed in claim 1 further comprising an inert gas and oxygen.

9. A method of etching silicon oxide comprising the steps of:  
preparing an etching gas composition comprising a mixture of carbon fluoride gas in which the ratio of fluorine atoms relative to carbon atoms is less than 2 and an auxiliary gas including hydrogen, fluorine and carbon atoms; and

implementing an etching procedure by generating a plasma of said etching gas composition and then applying said plasma onto said silicon oxide.

10. A method of etching silicon oxide as claimed in claim 9 wherein said carbon fluoride gas is at least one member selected from the group consisting of  $C_5F_8$ ,  $C_4F_6$ ,  $C_3F_4$  and  $C_2F_2$ , and mixtures thereof.

11. A method of etching silicon oxide as claimed in claim 9 wherein said auxiliary gas is at least one member selected from the group consisting of  $\text{CH}_2\text{F}_2$  and  $\text{CHF}_3$ , and mixtures thereof.

5 12. A method of etching silicon oxide as claimed in claim 9 wherein a ratio of the volumetric flow rate of said auxiliary gas with respect to that of said carbon fluoride gas is in a range of about 0.1-3.0.

13. A method of etching silicon oxide as claimed in claim 9 further wherein said etching gas composition comprises  $\text{CO}$ , and a ratio of the volumetric flow rate of said  $\text{CO}$  with respect to that of said carbon fluoride gas is in a range of about 1-30.

14. A method of manufacturing a contact hole of a semiconductor device comprising the steps of:

15 forming a silicon oxide layer by depositing silicon oxide on a semiconductor substrate;

forming a photoresist pattern as an etching mask on said silicon oxide layer;

loading said substrate on which said photoresist pattern is formed into a reaction chamber;

20 introducing an etching gas composition comprising a mixture of carbon fluoride gas in which the ratio of fluorine atoms relative to carbon atoms is less than 2 and an

auxiliary gas including hydrogen, fluorine and carbon atoms into said reaction chamber;  
and

producing plasma of said etching gas composition and then etching said silicon oxide layer by the produced plasma.

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15. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein said carbon fluoride gas is at least one member selected from the group consisting of  $C_5F_8$ ,  $C_4F_6$ ,  $C_3F_4$  and  $C_2F_2$ , and mixtures thereof, and wherein said auxiliary gas is at least one member selected from the group consisting of  $CH_2F_2$  and  $CHF_3$ , and mixtures thereof, and wherein a ratio of the volumetric flow rate of said auxiliary gas with respect to that of said carbon fluoride gas to said reaction chamber is in a range of about 0.1-3.0.

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16. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein said etching gas composition further comprises CO, and a ratio of the volumetric flow rate of said CO with respect to that of said carbon fluoride gas to said reaction chamber is in a range of about 1-30.

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17. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein said etching gas composition comprises about 5-20 part by volume of  $C_5F_8$  gas, about 200-500 parts by volume of Ar gas, about 20-150 parts by volume of CO gas, about 2-20 parts by volume of  $O_2$  gas, and about 2-15 parts by

volume of  $\text{CH}_2\text{F}_2$  gas, and further wherein a pressure within said reaction chamber is maintained in a range of about 10-60 Torr.

18. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein said photoresist is a photoresist applicable for DUV wavelength.

19. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein an aspect ratio of said contact hole is in a range of about 8-17.

20. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein a diameter of said contact hole is in a range of about 150-250 nm.

21. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein a thickness of said silicon oxide layer is in a range of about 20,000-40,000Å.

22. A method of manufacturing a contact hole of a semiconductor device as claimed in claim 14 wherein said semiconductor device is a DRAM device, and said

contact hole is an MC (metal contact hole) for connecting a metal layer formed on said silicon oxide layer formed on a capacitor with an impurity doped region.